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Sensory Assessment of Water Quality

B C I ZOETEMAN

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(National Institute for Water Supply), The Netherlands



Pergamon Press

Sensory Assessment Of Water Quality

Dr. Vijendra Singh



Sensory Assessment Of Water Quality:

Sensory Assessment of Water Quality B. C. J. Zoeteman, 2015-12-04 Environmental Science Volume 2 Sensory Assessment of Water Quality presents the methods for sensory water quality assessment This book discusses the various aspects of the problem of impaired taste and odor of water Organized into seven chapters this volume begins with an overview of the significance attributed to sensory assessment of water quality This text then examines the results obtained on sensory water quality assessment and on general water quality appraisal Other chapters describe the 20 types of drinking water and consider the effects of the sensory water quality assessment factors on water consumption This book discusses as well the types of chemical compounds present and their relation to water taste The final chapter deals with the number of applications and recommendations to assess sensory water quality aspects at least weekly in the case of surface water supplies by making an inquiry among the consumers located in the area served This book is a valuable resource for chemists

Sensory assessment of water quality, by... Bastiaan Cornelis Jan Zoeteman, 1980 *Sensory Assessment and Chemical Composition of Drinking Water* B. C. J. Zoeteman, 1978 **Water Supply and Health**, 2011-08-26 Water Supply and Health *Selected Water Resources Abstracts*, 1989 *Selected Water Resources Abstracts*, 1989 *The Human Right to Water* Malcolm Langford, Anna F. S. Russell, 2017-10-05 In a short space of time the right to water has emerged from relative obscurity to claim a prominent place in human rights theory and practice This book explores this rise descriptively and prescriptively It analyses the recognition use and partly impact of the right to water in international and comparative law civil society mobilisation and public policy It also scrutinises the normative implications of the right to water with a focus on challenges and puzzles it creates for law and policymaking These questions are explored globally and comparatively within different dynamics of the sector water allocation water access and urban and rural water reform and in conjunction with the right to sanitation This multi disciplinary volume reveals the diverse ways in which the right to water has been adopted but also its limitations when faced with the realities of political economy political ecology and partly traditional legal thought

Advances in Taste-and-odor Treatment and Control AWWA Research Foundation, 1995 *Water Research*, 1981

ENVIRONMENTAL CHEMISTRY: WATER AND SOIL POLLUTION Dr. Vijendra Singh, INTRODUCTION

Environmental science is the systematic study of the interaction of two worlds The word Environment is derived from an old French word environ meaning encircle The environment consists of four segments atmosphere hydrosphere lithosphere and biosphere Among all of substances water is a marvelous substance on earth Water is one of the abundantly available substances in nature Water is essential for all kinds of life and is the medium in which all living processes occur Water is renewable source but renewable takes time The hydrological cycle constantly purifies and redistributes fresh water on landmasses providing endless renewable resource At present there are many environmental issues which have grown in size and complexity day by day threatening the survival of mankind and all living organisms on earth Unfortunately with progress

in science and technology man has been dumping waste material into atmosphere and causing pollution Environmental pollution can be divided among the categories of water air and soil pollution Emission of pollutants in air water and soil has caused considerable damage to our environment Water pollution disturbs the normal uses of water for irrigation agriculture industries public water supply and aquatic life Most of the human activities produce liquid effluents which are the prime cause of water pollution Rapid increase in population intensive agriculture growing industrialization and urbanization has resulted in progressive deterioration in the quality of water in our natural reservoirs Most of the water related diseases are some way or other concerned with the polluted water supply Water borne infections diseases like cholera dysentery typhoid jaundice and worm infection are still the major public health problems in developing countries Another substance which plays a very important role is soil as it produces food for human beings and animals Soil is a complex of physical and biological systems which give support to the plants and supplies water and essential nutrients to them It is the main reservoir of the minerals essential for normal growth of the plants The soil consists of four major components i e mineral matter organic matter soil air and soil water All these components cannot be separated with much satisfaction because they are present very intimately mixed with each other With careful husbandry soil can be replenished and renewed indefinitely Hazardous chemicals heavily pollute soil day by day Disposal of industrial waste is the major problem responsible for soil pollution These waste products are also tipped on soil enhancing the extent of soil pollution As a result hazardous chemicals can enter into human food chain from the soil or water disturb the biochemical process and finally lead to serious effects on living organisms Large scale soil and water pollution is one of the primary factors behind the high prevalence of soil and water borne diseases Soil degradation can reduce the quality of our food whereas deforestation can reduce the availability plants to make current medicines and medicines for the future Heavy metal pollution has also a serious impact Metal pollution can affect all environments but its effects most long lasting in soil Drinking is one of the major routes of intake of heavy metals by the human body Soil contamination should be a primary concern in India because the country relies heavily on agriculture Toxic metal is the one which is neither essential nor beneficial but exhibits a positive catastrophic effect on normal metabolic function even when present in small amounts and may at times be responsible for permanent disorders or malfunctioning of organ system leading finally to death This BOOK consists of five chapters CHAPTER 1 INTRODUCTION This chapter is divided into two parts 1A WATER This part contains Introduction of Water Properties of Water Major Water Compartments Types while Fluoride F by spectrophotometric AIMIL C160 80314 Sodium Na Potassium K by flamephotometry ELICO CL 220 and heavy metals by AAS In order to estimate the quality of the groundwater for drinking purposes an indexing system Water Quality Index WQI based on Adak and Purohit 20 was determined Evaluation of the quality of wastewater on the basis of percent sodium %Na is excellent was determined Quantitatively United States Salinity Laboratory USSL proposed for the first time a better index called Sodium Absorption Ratio SAR was determined Sodium

hazard of irrigation water can be well understood by knowing SAR There is a significant correlation between SAR values of irrigation water and the extent to which sodium is absorbed by the soil

METHODOLOGY FOR SOIL

Soil samples were collected from thirteen different vicinal locations of various industrial sites where industrial wastewater use for irrigation Samples were collected in good quality polyethylene bags labeled properly and analyzed in laboratory for their all parameters Monitoring was done during the four intervals throughout the year from different vicinal locations of various industrial sites of Jaipur city where industrial wastewater use for irrigation April 2004 to March 2005 Soil samples may be analyzed for the following parameters like pH EC Organic Carbon Nitrogen Phosphorous Potassium Fe Zn Cu Mn etc

CHAPTER 4 RESULTS AND DISCUSSION

This chapter is divided into three parts

4A WATER FOR DOMESTIC PURPOSES

In these sites positive correlation between surface and ground water was recognized The groundwater near solid waste and liquid waste disposal sites was polluted whereas the groundwater away from disposal sites was not much affected The values obtained were compared with standards of ISI ICMR and WHO From the observations it may inferred that the concentration of pH EC Ca²⁺ Na K Mg²⁺ SO₄²⁻ CO₃²⁻ HCO₃⁻ Cl DO and BOD are within permissible limits of ISI ICMR WHO but NO₃ TDS TH COD and WQI values show the poor water quality in most of the studied groundwater samples taken from vicinal locations of various industrial sites Concentrations of all heavy metals like Cr Cu Cd Mn Ni Pb Fe As Zn are within permissible limits Higher concentrations of Zn in very few samples have been observed WQI values of these samples were ranging from 35.08 to 268.78 which means that only 37.5% sample s water were fit for human consumption directly but 62.5% water of all sources can be used for domestic consumption after appropriate treatment whereas remaining 37.5% water of samples were of very poor quality and was not recommended for domestic purposes So it may be accomplished with the help of WQI that the water of the various samples were unfit for drinking purpose without further treatment mainly disinfections It may be concluded that the general characteristics of groundwater samples from the study area classify the water under moderate category and are tolerable for household and commercial purposes However high WQI and COD values suggest purification may be necessary for domestic consumption

4B WATER FOR IRRIGATION PURPOSES

The suitability of groundwater and wastewater for irrigation depends upon its mineral constituents The salts present in the water besides affecting the growth of the plants directly also affect the soil structure permeability and aeration which indirectly affect the plant growth Jaipur is undergoing rapid urbanization and industrialization Wastewater generated from various industries discharged into AMANISHAH NALA where this water is used for irrigation purpose The values obtained were compared with standards of ISI ICMR and WHO The concentrations of pH Na K Ca²⁺ Mg²⁺ SO₄²⁻ CO₃²⁻ HCO₃⁻ TH Cl NO₃ Oil Grease DO and F are within permissible limits in both groundwater and wastewater but definite contaminations with special reference to EC TDS BOD and COD in wastewater have been observed calls for at least primary treatment of wastewater before being used for irrigation High EC and TDS values reflect greater salinity of water and it cannot be suitable for irrigation under ordinary

conditions There was also a significant correlation between SAR values of irrigation water and the extent to which sodium is absorbed by the soil No excellent conclusion can be drawn to observed values but general conclusion can be drawn as The general characteristics of groundwater and industrial wastewater samples from the study area classify the water under moderate category and are good for household irrigation and commercial purposes and results of suitability evaluation indicate that there is no major pollution hazard in wastewater of AMANISHAH NALA However high BOD and COD values suggest purification may be necessary for sensitive crops and human consumption

4C SOIL FOR AGRICULTURAL PURPOSES

In all studied locations soil is moderate for all kinds of crops except sensitive ones Adjacent locations of all industrial areas under study have concentrations of pH EC organic carbon Fe Cu and Mn are within permissible limits and show good soil quality in most of the studied soil samples taken from vicinal locations of various industrial sites There is lack of concentrations of Zn in all soil samples and is need to give zinc sulphate fertilizer to compensate this but definite concentrations of P and K in soil samples have been observed at critical limit Some samples also have higher pH i e alkaline in nature and they need to give gypsum for reducing alkalinity from soil samples

CHAPTER 5 WASTEWATER TREATMENT AND SUGGESTIONS

The ultimate disposal of wastewater can only be onto the land or into the water But whenever the watercourses are used for the ultimate disposal the wastewater is given a treatment to prevent any injury to the aquatic life in the receiving water Normally the treatment consists of the removal of suspended and dissolved solids through different units if the treatment plants The treatment of industrial wastewater may be accomplished in part or as a whole either by the biological processes as done in the sanitary sewage or by processes very special for the industrial wastewater only Depending upon the constituents present in it the treatment may consist of any one or more treatment chemical or biological or both processes The chemical treatment should be provided only when it becomes unavoidable The selection of the particular treatment process depends on the effluent requirements and the characteristics of the waste Today it is not enough to emphasize the protection of the environment The fundamental purpose of water treatment is to remove impurities that may be offensive or injurious to health and well being of the individual and community Disinfectant should kill the pathogens quickly at room temperature It should be inexpensive and non toxic to humans and should provide protection against only contamination in water during conveyance or storage The Govt should immediately make laws banning industrial pollution Failure to do so will lead to substantial penalties and fine The water treatment plants should be installed in rural areas The rural inhabitants should try to avoid the use of pesticides in their fields All small scale and big industries must have anti pollution unit Create the awareness about the effects of high concentration of nitrate fluoride solids and hardness among villagers Through strict implementation of the Government s Water Treatment Programme water can be rendered safe for drinking Chapter 1 2 3 5 precisely details under various heads and chapter 4 details under water for domestic irrigation purposes and soil for agricultural purposes results discussion tables and graphs of each parameters

results evaluations assessments and comparison followed by a comprehensive list of relevant references after everything else of the BOOK

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